Case study title: **Hurricane Mitigation Study for GSA**

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Case study emphasis: building risk rating and mitigation measures and costs

Summary:

GSA was required by Congress to develop an inventory of federally-owned buildings that could be impacted by hurricanes, to rank those buildings into risk categories, and to develop possible mitigation measures for those buildings to reduce the financial impact to GSA from hurricane events. GSA needed the study complete for the 121 buildings located in six southeastern states within 4 months and at minimal study cost.

URS developed a methodology that utilized existing data about the buildings; this method required verification by actually visiting only 4 buildings. The existing data included GSA developed information on building structure type, number of floors, age, amount of glazing, etc. URS developed a series of site-specific GIS maps showing the building's relative location with respect to the floodplain, storm surge inundation, and wind isotachs. The building information and the hazard information were then used to develop a risk rating for each building.

Each building was rated as very high risk, high risk, medium risk, and low risk. Based on building construction type, age, roof construction, windows (and other building characteristics) and location relative to the hazards, conclusions can be drawn about the likely performance of the building during a hurricane event. A risk grading scale was created that accounted for the most important factors in building design and each building was "scored" and placed in one of the four risk categories.

The expected building performance, the building construction type and other characteristics also suggested a range of possible mitigation measures, each with an associated unit cost. From the grading scale and the presence of or lack of certain characteristics, and the building size, a cost estimate of the mitigation measures was developed.

For summary and presentation purposes, using spreadsheet and database tools, total estimates for the buildings located in each state in each risk category were created. It is expected that the use of the rapid risk rating method and the cost estimates developed from this rating will help improve the delivery of a shorter list of buildings that actually need to be retrofitted with appropriate mitigation improvements. One of the benefits of assessment methods such as this, is that a large number of buildings can be evaluated with minimal field visits, at minimal cost, in minimal time yet the result provides the user with a set of buildings that have been screened with an action plan for taking the next steps.

Date that model application was completed: September 16, 2002

Case study geographical location: Southeast United States

Vulnerability assessment indicators: Building location with respect to floodplain, storm surge and wind isotachs, building age and construction type, natural hazard history at the site

Methodology data requirements: building location information, building structure type, age, amount of glazing, roof type, openings in building below expected flood, natural hazard history

Direct participants in the application of the model of the vulnerability assessment:

National and Subnational (regional) Governments
Private Consulting Firm

Economic and social sector participants directly involved:

Methodology objective: determine likely risk each building has to damage from hurricanes, rank buildings as very high risk, high risk, medium risk, and low risk

Methodology output: ranking of buildings per requirements with a mitigation cost for each building, cost for each risk category and for each state.

Results of methodology application at case study site: development of mitigation costs for each risk category for each state

Lessons learned: application of existing data on buildings and hazards can be used with a minimum amount of actual on-site information – method could save many dollars in the building screening process.